



SEQUENCE LISTING

RECEIVED
OCT 28 2003
TECH CENTER 1600/2900

<110> Brunham, Robert C
University of Manitoba

<120> DNA IMMUNIZATION AGAINST CHLAMYDIA INFECTION

<130> 1038-1094 MIS:jb

<140> 09/647,946

<141> 2000-12-06

<150> PCT/CA99/00292

<151> 1999-04-07

<150> 09/055,765

<151> 1998-04-07

<160> 17

<170> PatentIn Ver. 2.0

<210> 1

<211> 393

<212> PRT

<213> amino acid

<400> 1

Met Lys Lys Leu Leu Lys Ser Val Leu Val Phe Ala Ala Leu Ser Ser
1 5 10 15

Ala Ser Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
20 25 30

Leu Met Ile Asp Gly Ile Leu Trp Glu Gly Phe Gly Gly Asp Pro Cys
35 40 45

Asp Pro Cys Thr Thr Trp Cys Asp Ala Ile Ser Met Arg Met Gly Tyr
50 55 60

Tyr Gly Asp Phe Val Phe Asp Arg Val Leu Lys Thr Asp Val Asn Lys
65 70 75 80

Glu Phe Gln Met Gly Asp Lys Pro Thr Ser Thr Thr Gly Asn Ala Thr
85 90 95

Ala Pro Thr Thr Leu Thr Ala Arg Glu Asn Pro Ala Tyr Gly Arg His
100 105 110

Met Gln Asp Ala Glu Met Phe Thr Asn Ala Ala Cys Met Ala Leu Asn
115 120 125

Ile Trp Asp Arg Phe Asp Val Phe Cys Thr Leu Gly Ala Ser Ser Gly
130 135 140

Tyr Leu Lys Gly Asn Ser Ala Ser Phe Asn Leu Val Gly Leu Phe Gly
145 150 155 160

Asp Asn Glu Asn Gln Ser Thr Val Lys Thr Asn Ser Val Pro Asn Met
 165 170 175
 Ser Leu Asp Gln Ser Val Val Glu Leu Tyr Thr Asp Thr Ala Phe Ser
 180 185 190
 Trp Ser Val Gly Ala Arg Ala Ala Leu Trp Glu Cys Gly Cys Ala Thr
 195 200 205
 Leu Gly Ala Ser Phe Gln Tyr Ala Gln Ser Lys Pro Lys Val Glu Glu
 210 215 220
 Leu Asn Val Leu Cys Asn Ala Ala Glu Phe Thr Ile Asn Lys Pro Lys
 225 230 235 240
 Gly Tyr Val Gly Gln Glu Phe Pro Leu Ala Leu Ile Ala Gly Thr Asp
 245 250 255
 Ala Ala Thr Gly Thr Lys Asp Ala Ser Ile Asp Tyr Asn Glu Trp Gln
 260 265 270
 Ala Ser Leu Ala Leu Ser Tyr Arg Leu Asn Met Phe Thr Pro Tyr Ile
 275 280 285
 Gly Val Lys Trp Ser Arg Ala Ser Phe Asp Ala Asp Thr Ile Arg Ile
 290 295 300
 Ala Gln Pro Lys Ser Ala Thr Ala Ile Phe Asp Thr Thr Thr Leu Asn
 305 310 315 320
 Pro Thr Ile Ala Gly Ala Gly Asp Val Lys Ala Ser Ala Glu Gly Gln
 325 330 335
 Leu Gly Asp Thr Met Gln Ile Val Ser Leu Gln Leu Asn Lys Met Lys
 340 345 350
 Ser Arg Lys Ser Cys Gly Ile Ala Val Gly Thr Thr Ile Val Asp Ala
 355 360 365
 Asp Lys Tyr Ala Val Thr Val Glu Thr Arg Leu Ile Asp Glu Arg Ala
 370 375 380
 Ala His Val Asn Ala Gln Phe Arg Phe
 385 390

<210> 2
 <211> 394
 <212> PRT
 <213> amino acid

<400> 2

Met Lys Lys Leu Leu Lys Ser Val Leu Val Phe Ala Ala Leu Ser Ser
 1 5 10 15

Ala Ser Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
 20 25 30
 Leu Met Ile Asp Gly Ile Leu Trp Glu Gly Phe Gly Gly Asp Pro Cys
 35 40 45
 Asp Pro Cys Thr Thr Trp Cys Asp Ala Ile Ser Met Arg Met Gly Tyr
 50 55 60
 Tyr Gly Asp Phe Val Phe Asp Arg Val Leu Lys Thr Asp Val Asn Lys
 65 70 75 80
 Glu Phe Gln Met Gly Ala Lys Pro Thr Thr Thr Thr Gly Asn Ala Val
 85 90 95
 Ala Pro Ser Thr Leu Thr Ala Arg Glu Asn Pro Ala Tyr Gly Arg His
 100 105 110
 Met Gln Asp Ala Glu Met Phe Thr Asn Ala Ala Cys Met Ala Leu Asn
 115 120 125
 Ile Trp Asp Arg Phe Asp Val Phe Cys Thr Leu Gly Ala Ser Ser Gly
 130 135 140
 Tyr Leu Lys Gly Asn Ser Ala Ser Phe Asn Leu Val Gly Leu Phe Gly
 145 150 155 160
 Asn Asn Glu Asn Gln Thr Lys Val Ser Asn Gly Ala Phe Val Pro Asn
 165 170 175
 Met Ser Leu Asp Gln Ser Val Val Glu Leu Tyr Thr Asp Thr Ala Phe
 180 185 190
 Ala Trp Ser Val Gly Ala Arg Ala Ala Leu Trp Glu Cys Gly Cys Ala
 195 200 205
 Thr Leu Gly Ala Ser Phe Gln Tyr Ala Gln Ser Lys Pro Lys Val Glu
 210 215 220
 Glu Leu Asn Val Leu Cys Asn Ala Ala Glu Phe Thr Ile Asn Lys Pro
 225 230 235 240
 Lys Gly Tyr Val Gly Lys Glu Leu Pro Leu Asp Leu Thr Ala Gly Thr
 245 250 255
 Asp Ala Ala Thr Gly Thr Lys Asp Ala Ser Ile Asp Tyr Asn Glu Trp
 260 265 270
 Gln Ala Ser Leu Ala Leu Ser Tyr Arg Leu Asn Met Phe Thr Pro Tyr
 275 280 285
 Ile Gly Val Lys Trp Ser Arg Ala Ser Phe Asp Ala Asp Thr Ile Arg
 290 295 300
 Ile Ala Gln Pro Lys Ser Ala Glu Thr Ile Phe Asp Val Thr Thr Leu
 305 310 315 320
 Asn Pro Thr Ile Ala Gly Ala Gly Asp Val Lys Thr Ser Ala Glu Gly
 325 330 335

Gln Leu Gly Asp Thr Met Gln Ile Val Ser Leu Gln Leu Asn Lys Met
 340 345 350

Lys Ser Arg Lys Ser Cys Gly Ile Ala Val Gly Thr Thr Ile Val Asp
 355 360 365

Ala Asp Lys Tyr Ala Val Thr Val Glu Thr Arg Leu Ile Asp Glu Arg
 370 375 380

Ala Ala His Val Asn Ala Gln Phe Arg Phe
 385 390

<210> 3
 <211> 393
 <212> PRT
 <213> amino acid

<400> 3

Met Lys Lys Leu Leu Lys Ser Val Leu Val Phe Ala Ala Leu Ser Ser
 1 5 10 15

Ala Ser Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
 20 25 30

Leu Met Ile Asp Gly Ile Leu Trp Glu Gly Phe Gly Gly Asp Pro Cys
 35 40 45

Asp Pro Cys Thr Thr Trp Cys Asp Ala Ile Ser Met Arg Met Gly Tyr
 50 55 60

Tyr Gly Asp Phe Val Phe Asp Arg Val Leu Gln Thr Asp Val Asn Lys
 65 70 75 80

Glu Phe Gln Met Gly Ala Lys Pro Thr Ala Thr Thr Gly Asn Ala Ala
 85 90 95

Ala Pro Ser Thr Cys Thr Ala Arg Glu Asn Pro Ala Tyr Gly Arg His
 100 105 110

Met Gln Asp Ala Glu Met Phe Thr Asn Ala Ala Tyr Met Ala Leu Asn
 115 120 125

Ile Trp Asp Arg Phe Asp Val Phe Cys Thr Leu Gly Ala Thr Ser Gly
 130 135 140

Tyr Leu Lys Gly Asn Ser Ala Ser Phe Asn Leu Val Gly Leu Phe Gly
 145 150 155 160

Asp Asn Glu Asn Gln Ser Thr Val Lys Lys Asp Ala Val Pro Asn Met
 165 170 175

Ser Phe Asp Gln Ser Val Val Glu Leu Tyr Thr Asp Thr Thr Phe Ala
 180 185 190

Trp Ser Val Gly Ala Arg Ala Ala Leu Trp Glu Cys Gly Cys Ala Thr
 195 200 205
 Leu Gly Ala Ser Phe Gln Tyr Ala Gln Ser Lys Pro Lys Val Glu Glu
 210 215 220
 Leu Asn Val Leu Cys Asn Ala Ala Glu Phe Thr Ile Asn Lys Pro Lys
 225 230 235 240
 Gly Tyr Val Gly Lys Glu Phe Pro Leu Asp Leu Thr Ala Gly Thr Asp
 245 250 255
 Ala Ala Thr Gly Thr Lys Asp Ala Ser Ile Asp Tyr Asn Glu Trp Gln
 260 265 270
 Ala Ser Leu Ala Leu Ser Tyr Arg Leu Asn Met Phe Thr Pro Tyr Ile
 275 280 285
 Gly Val Lys Trp Ser Arg Ala Ser Phe Asp Ala Asp Thr Ile Arg Ile
 290 295 300
 Ala Gln Pro Lys Leu Ala Thr Ala Ile Phe Asp Thr Thr Thr Leu Asn
 305 310 315 320
 Pro Thr Ile Ala Gly Ala Gly Glu Val Lys Ala Asn Ala Glu Gly Gln
 325 330 335
 Leu Gly Asp Thr Met Gln Ile Val Ser Leu Gln Leu Asn Lys Met Lys
 340 345 350
 Ser Arg Lys Ser Cys Gly Ile Ala Val Gly Thr Thr Ile Val Asp Ala
 355 360 365
 Asp Lys Tyr Ala Val Thr Val Glu Thr Arg Leu Ile Asp Glu Arg Ala
 370 375 380
 Ala His Val Asn Ala Gln Phe Arg Phe
 385 390

<210> 4
 <211> 393
 <212> PRT
 <213> amino acid

<400> 4

Met Lys Lys Leu Leu Lys Ser Val Leu Val Phe Ala Ala Leu Ser Ser
 1 5 10 15
 Ala Ser Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
 20 25 30
 Leu Met Ile Asp Gly Ile Leu Trp Glu Gly Phe Gly Gly Asp Pro Cys
 35 40 45

Asp	Pro	Cys	Thr	Thr	Trp	Cys	Asp	Ala	Ile	Ser	Met	Arg	Met	Gly	Tyr
50						55					60				
Tyr	Gly	Asp	Phe	Val	Phe	Asp	Arg	Val	Leu	Glu	Thr	Asp	Val	Asn	Lys
65					70					75					80
Glu	Phe	His	Met	Gly	Ala	Lys	Pro	Thr	Ser	Thr	Thr	Gly	Asn	Ala	Thr
				85					90					95	
Ala	Pro	Thr	Thr	Leu	Thr	Ala	Arg	Glu	Asn	Pro	Ala	Tyr	Gly	Arg	His
			100					105					110		
Met	Gln	Asp	Ala	Glu	Met	Phe	Thr	Asn	Ala	Ala	Cys	Met	Ala	Leu	Asn
		115					120					125			
Ile	Trp	Asp	Arg	Phe	Asp	Val	Phe	Cys	Thr	Leu	Gly	Ala	Thr	Ser	Gly
	130					135					140				
Tyr	Leu	Lys	Gly	Asn	Ser	Ala	Ser	Phe	Asn	Leu	Val	Gly	Leu	Phe	Gly
145					150					155					160
Asp	Asn	Glu	Asn	Gln	Lys	Thr	Val	Lys	Ala	Glu	Ser	Val	Pro	Asn	Met
				165					170					175	
Ser	Phe	Asp	Gln	Ser	Val	Val	Glu	Leu	Tyr	Thr	Asp	Thr	Thr	Phe	Ala
			180					185					190		
Trp	Ser	Val	Gly	Ala	Arg	Ala	Ala	Leu	Trp	Glu	Cys	Gly	Cys	Ala	Thr
		195					200					205			
Leu	Gly	Ala	Ser	Phe	Gln	Tyr	Ala	Gln	Ser	Lys	Pro	Lys	Val	Glu	Glu
	210					215					220				
Leu	Asn	Val	Leu	Cys	Asn	Ala	Ala	Glu	Phe	Thr	Ile	Asn	Lys	Pro	Lys
225					230					235					240
Gly	Tyr	Val	Gly	Lys	Glu	Phe	Pro	Leu	Asp	Leu	Thr	Ala	Gly	Thr	Asp
				245					250					255	
Ala	Ala	Thr	Gly	Thr	Lys	Asp	Ala	Ser	Ile	Asp	Tyr	Asn	Glu	Trp	Gln
			260					265					270		
Ala	Ser	Leu	Ala	Leu	Ser	Tyr	Arg	Leu	Asn	Met	Phe	Thr	Pro	Tyr	Ile
		275					280					285			
Gly	Val	Lys	Trp	Ser	Arg	Ala	Ser	Phe	Asp	Ala	Asp	Thr	Ile	Arg	Ile
	290					295					300				
Ala	Gln	Pro	Lys	Ser	Ala	Thr	Ala	Ile	Phe	Asp	Thr	Thr	Thr	Leu	Asn
305					310					315					320
Pro	Thr	Ile	Ala	Gly	Ala	Gly	Asp	Val	Lys	Thr	Gly	Thr	Glu	Gly	Gln
				325					330					335	
Leu	Gly	Asp	Thr	Met	Gln	Ile	Val	Ser	Leu	Gln	Leu	Asn	Lys	Met	Lys
			340					345					350		
Ser	Arg	Lys	Ser	Cys	Gly	Ile	Ala	Val	Gly	Thr	Thr	Ile	Val	Asp	Ala
		355					360					365			

Asp Lys Tyr Ala Val Thr Val Glu Thr Arg Leu Ile Asp Glu Arg Ala
 370 375 380

Ala His Val Asn Ala Gln Phe Arg Phe
 385 390

<210> 5
 <211> 394
 <212> PRT
 <213> amino acid

<400> 5

Met Lys Lys Leu Leu Lys Ser Val Leu Val Phe Ala Ala Leu Ser Ser
 1 5 10 15

Ala Ser Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
 20 25 30

Leu Met Ile Asp Gly Ile Leu Trp Glu Gly Phe Gly Gly Asp Pro Cys
 35 40 45

Asp Pro Cys Thr Thr Trp Cys Asp Ala Ile Ser Met Arg Met Gly Tyr
 50 55 60

Tyr Gly Asp Phe Val Phe Asp Arg Val Leu Gln Thr Asp Val Asn Lys
 65 70 75 80

Glu Phe Gln Met Gly Ala Lys Pro Thr Thr Ala Thr Gly Asn Ala Ala
 85 90 95

Ala Pro Ser Thr Cys Thr Ala Arg Glu Asn Pro Ala Tyr Gly Arg His
 100 105 110

Met Gln Asp Ala Glu Met Phe Thr Asn Ala Ala Tyr Met Ala Leu Asn
 115 120 125

Ile Trp Asp Arg Phe Asp Val Phe Cys Thr Leu Gly Ala Thr Ser Gly
 130 135 140

Tyr Leu Lys Gly Asn Ser Ala Ser Phe Asn Leu Val Gly Leu Phe Gly
 145 150 155 160

Asp Asn Glu Asn His Ala Thr Val Ser Asp Ser Lys Leu Val Pro Asn
 165 170 175

Met Ser Leu Asp Gln Ser Val Val Glu Leu Tyr Thr Asp Thr Thr Phe
 180 185 190

Ala Trp Ser Ala Gly Ala Arg Ala Ala Leu Trp Glu Cys Gly Cys Ala
 195 200 205

Thr Leu Gly Ala Ser Phe Gln Tyr Ala Gln Ser Lys Pro Lys Val Glu
 210 215 220

Glu Leu Asn Val Leu Cys Asn Ala Ala Glu Phe Thr Ile Asn Lys Pro
 225 230 235 240
 Lys Gly Tyr Val Gly Gln Glu Phe Pro Leu Asp Leu Lys Ala Gly Thr
 245 250 255
 Asp Gly Val Thr Gly Thr Lys Asp Ala Ser Ile Asp Tyr Asn Glu Trp
 260 265 270
 Gln Ala Ser Leu Ala Leu Ser Tyr Arg Leu Asn Met Phe Thr Pro Tyr
 275 280 285
 Ile Gly Val Lys Trp Ser Arg Ala Ser Phe Asp Ala Asp Thr Ile Arg
 290 295 300
 Ile Ala Gln Pro Lys Ser Ala Thr Thr Val Phe Asp Val Thr Thr Leu
 305 310 315 320
 Asn Pro Thr Ile Ala Gly Ala Gly Asp Val Lys Ala Ser Ala Glu Gly
 325 330 335
 Gln Leu Gly Asp Thr Met Gln Ile Val Ser Leu Gln Leu Asn Lys Met
 340 345 350
 Lys Ser Arg Lys Ser Cys Gly Ile Ala Val Gly Thr Thr Ile Val Asp
 355 360 365
 Ala Asp Lys Tyr Ala Val Thr Val Glu Thr Arg Leu Ile Asp Glu Arg
 370 375 380
 Ala Ala His Val Asn Ala Gln Phe Arg Phe
 385 390

<210> 6
 <211> 395
 <212> PRT
 <213> amino acid

<400> 6

Met Lys Lys Leu Leu Lys Ser Val Leu Val Phe Ala Ala Leu Ser Ser
 1 5 10 15
 Ala Ser Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
 20 25 30
 Leu Met Ile Asp Gly Ile Leu Trp Glu Gly Phe Gly Gly Asp Pro Cys
 35 40 45
 Asp Pro Cys Thr Thr Trp Cys Asp Ala Ile Ser Met Arg Met Gly Tyr
 50 55 60
 Tyr Gly Asp Phe Val Phe Asp Arg Val Leu Lys Thr Asp Val Asn Lys
 65 70 75 80

Glu	Phe	Glu	Met	Gly	Glu	Ala	Leu	Ala	Gly	Ala	Ser	Gly	Asn	Thr	Thr	
				85					90					95		
Ser	Thr	Leu	Ser	Lys	Leu	Val	Glu	Arg	Thr	Asn	Pro	Ala	Tyr	Gly	Lys	
				100					105					110		
His	Met	Gln	Asp	Ala	Glu	Met	Phe	Thr	Asn	Ala	Ala	Cys	Met	Thr	Leu	
				115					120					125		
Asn	Ile	Trp	Asp	Arg	Phe	Asp	Val	Phe	Cys	Thr	Leu	Gly	Ala	Thr	Ser	
				130					135					140		
Gly	Tyr	Leu	Lys	Gly	Asn	Ser	Ala	Ser	Phe	Asn	Leu	Val	Gly	Leu	Phe	
				145					150					155		
Gly	Asp	Gly	Val	Asn	Ala	Thr	Lys	Pro	Ala	Ala	Asp	Ser	Ile	Pro	Asn	
				165					170					175		
Val	Gln	Leu	Asn	Gln	Ser	Val	Val	Glu	Leu	Tyr	Thr	Asp	Thr	Thr	Phe	
				180					185					190		
Ala	Trp	Ser	Val	Gly	Ala	Arg	Ala	Ala	Leu	Trp	Glu	Cys	Gly	Cys	Ala	
				195					200					205		
Thr	Leu	Gly	Ala	Ser	Phe	Gln	Tyr	Ala	Gln	Ser	Lys	Pro	Lys	Ile	Glu	
				210					215					220		
Glu	Leu	Asn	Val	Leu	Cys	Asn	Ala	Ala	Glu	Phe	Thr	Ile	Asn	Lys	Pro	
				225					230					235		
Lys	Gly	Tyr	Val	Gly	Lys	Glu	Phe	Pro	Leu	Asp	Leu	Thr	Ala	Gly	Thr	
				245					250					255		
Asp	Ala	Ala	Thr	Gly	Thr	Lys	Asp	Ala	Ser	Ile	Asp	Tyr	Asn	Glu	Trp	
				260					265					270		
Gln	Ala	Ser	Leu	Ser	Leu	Ser	Tyr	Arg	Leu	Asn	Met	Phe	Thr	Pro	Tyr	
				275					280					285		
Ile	Gly	Val	Lys	Trp	Ser	Arg	Ala	Ser	Phe	Asp	Ser	Asp	Thr	Ile	Arg	
				290					295					300		
Ile	Ala	Gln	Pro	Arg	Leu	Val	Thr	Pro	Val	Val	Asp	Ile	Thr	Thr	Leu	
				305					310					315		
Asn	Pro	Thr	Ile	Ala	Gly	Cys	Gly	Ser	Val	Ala	Gly	Ala	Asn	Thr	Glu	
				325					330					335		
Gly	Gln	Ile	Ser	Asp	Thr	Met	Gln	Ile	Val	Ser	Leu	Gln	Leu	Asn	Lys	
				340					345					350		
Met	Lys	Ser	Arg	Lys	Ser	Cys	Gly	Ile	Ala	Val	Gly	Thr	Thr	Ile	Val	
				355					360					365		
Asp	Ala	Asp	Lys	Tyr	Ala	Val	Thr	Val	Glu	Thr	Arg	Leu	Ile	Asp	Glu	
				370					375					380		
Arg	Ala	Ala	His	Val	Asn	Ala	Gln	Phe	Arg	Phe						
				385					390					395		

<210> 7
 <211> 397
 <212> PRT
 <213> amino acid

<400> 7

Met	Lys	Lys	Leu	Leu	Lys	Ser	Val	Leu	Val	Phe	Ala	Ala	Leu	Ser	Ser	1	5	10	15
Ala	Ser	Ser	Leu	Gln	Ala	Leu	Pro	Val	Gly	Asn	Pro	Ala	Glu	Pro	Ser	20	25	30	
Leu	Met	Ile	Asp	Gly	Ile	Leu	Trp	Glu	Gly	Phe	Gly	Gly	Asp	Pro	Cys	35	40	45	
Asp	Pro	Cys	Thr	Thr	Trp	Cys	Asp	Ala	Ile	Ser	Met	Arg	Val	Gly	Tyr	50	55	60	
Tyr	Gly	Asp	Phe	Val	Phe	Asp	Arg	Val	Leu	Lys	Thr	Asp	Val	Asn	Lys	65	70	75	80
Glu	Phe	Gln	Met	Gly	Ala	Glu	Pro	Thr	Thr	Ser	Asp	Thr	Ala	Gly	Leu	85	90	95	
Ser	Asn	Asp	Pro	Thr	Thr	Asn	Val	Ala	Arg	Pro	Asn	Pro	Ala	Tyr	Gly	100	105	110	
Lys	His	Met	Gln	Asp	Ala	Glu	Met	Phe	Thr	Asn	Ala	Ala	Tyr	Met	Ala	115	120	125	
Leu	Asn	Ile	Trp	Asp	Arg	Phe	Asp	Val	Phe	Cys	Thr	Leu	Gly	Ala	Thr	130	135	140	
Thr	Gly	Tyr	Leu	Lys	Gly	Asn	Ser	Ala	Ser	Phe	Asn	Leu	Val	Gly	Leu	145	150	155	160
Phe	Gly	Thr	Lys	Thr	Gln	Ser	Thr	Asn	Phe	Asn	Thr	Ala	Lys	Leu	Val	165	170	175	
Pro	Asn	Thr	Ala	Leu	Asn	Gln	Ala	Val	Val	Glu	Leu	Tyr	Thr	Asp	Thr	180	185	190	
Thr	Phe	Ala	Trp	Ser	Val	Gly	Ala	Arg	Ala	Ala	Leu	Trp	Glu	Cys	Gly	195	200	205	
Cys	Ala	Thr	Leu	Gly	Ala	Ser	Phe	Gln	Tyr	Ala	Gln	Ser	Lys	Pro	Lys	210	215	220	
Val	Glu	Glu	Leu	Asn	Val	Leu	Cys	Asp	Ala	Ser	Glu	Phe	Thr	Ile	Asn	225	230	235	240
Lys	Pro	Lys	Gly	Tyr	Val	Gly	Ala	Glu	Phe	Pro	Leu	Asp	Ile	Thr	Ala	245	250	255	

Gly Thr Glu Ala Ala Thr Gly Thr Lys Asp Ala Ser Ile Asp Tyr Asn
 260 265 270
 Glu Trp Gln Ala Ser Leu Ala Leu Ser Tyr Arg Leu Asn Met Phe Thr
 275 280 285
 Pro Tyr Ile Gly Val Lys Trp Ser Arg Val Ser Phe Asp Ala Asp Thr
 290 295 300
 Ile Arg Ile Ala Gln Pro Lys Leu Ala Glu Ala Val Leu Asp Val Thr
 305 310 315 320
 Thr Leu Asn Pro Thr Ile Ala Gly Lys Gly Ser Val Val Ala Ser Gly
 325 330 335
 Ser Glu Asn Glu Leu Ala Asp Thr Met Gln Ile Val Ser Leu Gln Leu
 340 345 350
 Asn Lys Met Lys Ser Arg Lys Ser Cys Gly Ile Ala Val Gly Thr Thr
 355 360 365
 Ile Val Asp Ala Asp Lys Tyr Ala Val Thr Val Glu Thr Arg Leu Ile
 370 375 380
 Asp Glu Arg Ala Ala His Val Asn Ala Gln Phe Arg Phe
 385 390 395

<210> 8
 <211> 396
 <212> PRT
 <213> amino acid

<400> 8

Met Lys Lys Leu Leu Lys Ser Val Leu Val Phe Ala Ala Leu Ser Ser
 1 5 10 15
 Ala Ser Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
 20 25 30
 Leu Met Ile Asp Gly Ile Leu Trp Glu Gly Phe Gly Gly Asp Pro Cys
 35 40 45
 Asp Pro Cys Thr Thr Trp Cys Asp Ala Ile Ser Met Arg Met Gly Tyr
 50 55 60
 Tyr Gly Asp Phe Val Phe Asp Arg Val Leu Lys Thr Asp Val Asn Lys
 65 70 75 80
 Glu Phe Gln Met Gly Ala Ala Pro Thr Thr Ser Asp Val Ala Gly Leu
 85 90 95
 Glu Lys Asp Pro Val Ala Asn Val Ala Arg Pro Asn Pro Ala Tyr Gly
 100 105 110

Lys His Met Gln Asp Ala Glu Met Phe Thr Asn Ala Ala Tyr Met Ala
 115 120 125
 Leu Asn Ile Trp Asp Arg Phe Asp Val Phe Cys Thr Leu Gly Ala Thr
 130 135 140
 Thr Gly Tyr Leu Lys Gly Asn Ser Ala Ser Phe Asn Leu Val Gly Leu
 145 150 155 160
 Phe Gly Thr Lys Thr Gln Ser Ser Gly Phe Asp Thr Ala Asn Ile Val
 165 170 175
 Pro Asn Thr Ala Leu Asn Gln Ala Val Val Glu Leu Tyr Thr Asp Thr
 180 185 190
 Thr Phe Ala Trp Ser Val Gly Ala Arg Ala Ala Leu Trp Glu Cys Gly
 195 200 205
 Cys Ala Thr Leu Gly Ala Ser Phe Gln Tyr Ala Gln Ser Lys Pro Lys
 210 215 220
 Val Glu Glu Leu Asn Val Leu Cys Asn Ala Ser Glu Phe Thr Ile Asn
 225 230 235 240
 Lys Pro Lys Gly Tyr Val Gly Ala Glu Phe Pro Leu Asp Ile Thr Ala
 245 250 255
 Gly Thr Glu Ala Ala Thr Gly Thr Lys Asp Ala Ser Ile Asp Tyr Asn
 260 265 270
 Glu Trp Gln Ala Ser Leu Ala Leu Ser Tyr Arg Leu Asn Met Phe Thr
 275 280 285
 Pro Tyr Ile Gly Val Lys Trp Ser Arg Val Ser Phe Asp Ala Asp Thr
 290 295 300
 Ile Arg Ile Ala Gln Pro Lys Leu Ala Lys Pro Val Leu Asp Thr Thr
 305 310 315 320
 Thr Leu Asn Pro Thr Ile Ala Gly Lys Gly Thr Val Val Ser Ser Ala
 325 330 335
 Glu Asn Glu Leu Ala Asp Thr Met Gln Ile Val Ser Leu Gln Leu Asn
 340 345 350
 Lys Met Lys Ser Arg Lys Ser Cys Gly Ile Ala Val Gly Thr Thr Val
 355 360 365
 Val Asp Ala Asp Lys Tyr Ala Val Thr Ile Glu Thr Arg Leu Ile Asp
 370 375 380
 Glu Arg Ala Ala His Val Asn Ala Gln Phe Arg Phe
 385 390 395

<210> 9
 <211> 397
 <212> PRT
 <213> amino acid

<400> 9

Met	Lys	Lys	Leu	Leu	Lys	Ser	Val	Leu	Val	Phe	Ala	Ala	Leu	Ser	Ser	1	5	10	15
Ala	Ser	Ser	Leu	Gln	Ala	Leu	Pro	Val	Gly	Asn	Pro	Ala	Glu	Pro	Ser	20	25	30	
Leu	Met	Ile	Asp	Gly	Ile	Leu	Trp	Glu	Gly	Phe	Gly	Gly	Asp	Pro	Cys	35	40	45	
Asp	Pro	Cys	Thr	Thr	Trp	Cys	Asp	Ala	Ile	Ser	Met	Arg	Val	Gly	Tyr	50	55	60	
Tyr	Gly	Asp	Phe	Val	Phe	Asp	Arg	Val	Leu	Lys	Thr	Asp	Val	Asn	Lys	65	70	75	80
Glu	Phe	Gln	Met	Gly	Ala	Ala	Pro	Thr	Thr	Ser	Asp	Val	Ala	Gly	Leu	85	90	95	
Gln	Asn	Asp	Pro	Thr	Thr	Asn	Asn	Ala	Arg	Pro	Asn	Pro	Ala	Tyr	Gly	100	105	110	
Lys	His	Met	Gln	Asp	Ala	Glu	Met	Phe	Thr	Asn	Ala	Ala	Tyr	Met	Ala	115	120	125	
Leu	Asn	Ile	Trp	Asp	Arg	Phe	Asp	Val	Phe	Cys	Thr	Leu	Gly	Ala	Thr	130	135	140	
Thr	Gly	Tyr	Leu	Lys	Gly	Asn	Ser	Ala	Ser	Phe	Asn	Leu	Val	Gly	Leu	145	150	155	160
Phe	Gly	Thr	Lys	Thr	Gln	Ser	Ser	Ser	Phe	Asn	Thr	Ala	Lys	Leu	Ile	165	170	175	
Pro	Thr	Ala	Ser	Leu	Asn	Glu	Ala	Val	Val	Glu	Leu	Tyr	Ile	Asn	Thr	180	185	190	
Thr	Phe	Ala	Trp	Ser	Val	Gly	Ala	Arg	Ala	Ala	Leu	Trp	Glu	Cys	Gly	195	200	205	
Cys	Ala	Thr	Leu	Gly	Ala	Ser	Phe	Gln	Tyr	Ala	Gln	Ser	Lys	Pro	Lys	210	215	220	
Val	Glu	Glu	Leu	Asn	Val	Leu	Cys	Asn	Ala	Ser	Glu	Phe	Thr	Ile	Asn	225	230	235	240
Lys	Pro	Lys	Gly	Tyr	Val	Gly	Ala	Glu	Phe	Pro	Leu	Asn	Ile	Thr	Ala	245	250	255	
Gly	Thr	Glu	Ala	Ala	Thr	Gly	Thr	Lys	Asp	Ala	Ser	Ile	Asp	Tyr	Asn	260	265	270	

Glu Trp Gln Ala Ser Leu Ala Leu Ser Tyr Arg Leu Asn Met Phe Thr
 275 280 285
 Pro Tyr Ile Gly Val Lys Trp Ser Arg Val Ser Phe Asp Ala Asp Thr
 290 295 300
 Ile Arg Ile Ala Gln Pro Lys Leu Ala Glu Ala Ile Leu Asp Val Thr
 305 310 315 320
 Thr Leu Asn Pro Thr Ile Ala Gly Lys Gly Ser Val Val Ser Ala Gly
 325 330 335
 Thr Asp Asn Glu Leu Ala Asp Thr Met Gln Ile Val Ser Leu Gln Leu
 340 345 350
 Asn Lys Met Lys Ser Arg Lys Ser Cys Gly Ile Ala Val Gly Thr Thr
 355 360 365
 Ile Val Asp Ala Asp Lys Tyr Ala Val Thr Val Glu Ala Arg Leu Ile
 370 375 380
 Asp Glu Arg Ala Ala His Val Asn Ala Gln Phe Arg Phe
 385 390 395

<210> 10
 <211> 397
 <212> PRT
 <213> amino acid

<400> 10

Met Lys Lys Leu Leu Lys Ser Val Leu Val Phe Ala Ala Leu Ser Ser
 1 5 10 15
 Ala Ser Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
 20 25 30
 Leu Met Ile Asp Gly Ile Leu Trp Glu Gly Phe Gly Gly Asp Pro Cys
 35 40 45
 Asp Pro Cys Ala Thr Trp Cys Asp Ala Ile Ser Met Arg Val Gly Tyr
 50 55 60
 Tyr Gly Asp Phe Val Phe Asp Arg Val Leu Lys Thr Asp Val Asn Lys
 65 70 75 80
 Glu Phe Gln Met Gly Ala Ala Pro Thr Thr Asn Asp Ala Ala Asp Leu
 85 90 95
 Gln Asn Asp Pro Lys Thr Asn Val Ala Arg Pro Asn Pro Ala Tyr Gly
 100 105 110
 Lys His Met Gln Asp Ala Glu Met Phe Thr Asn Ala Ala Tyr Met Ala
 115 120 125

Leu Asn Ile Trp Asp Arg Phe Asp Val Phe Cys Thr Leu Gly Ala Thr
 130 135 140
 Thr Gly Tyr Leu Lys Gly Asn Ser Ala Ser Phe Asn Leu Val Gly Leu
 145 150 155 160
 Phe Gly Thr Lys Thr Lys Ser Ser Asp Phe Asn Thr Ala Lys Leu Val
 165 170 175
 Pro Asn Ile Ala Leu Asn Arg Ala Val Val Glu Leu Tyr Thr Asp Thr
 180 185 190
 Thr Phe Ala Trp Ser Val Gly Ala Arg Ala Ala Leu Trp Glu Cys Gly
 195 200 205
 Cys Ala Thr Leu Gly Ala Ser Phe Gln Tyr Ala Gln Ser Lys Pro Lys
 210 215 220
 Val Glu Glu Leu Asn Val Leu Cys Asn Ala Ser Glu Phe Thr Ile Asn
 225 230 235 240
 Lys Pro Lys Gly Tyr Val Gly Ala Glu Phe Pro Leu Asp Ile Thr Ala
 245 250 255
 Gly Thr Glu Ala Ala Thr Gly Thr Lys Asp Ala Ser Ile Asp Tyr Asn
 260 265 270
 Glu Trp Gln Ala Ser Leu Ala Leu Ser Tyr Arg Leu Asn Met Phe Thr
 275 280 285
 Pro Tyr Ile Gly Val Lys Trp Ser Arg Val Ser Phe Asp Ala Asp Thr
 290 295 300
 Ile Arg Ile Ala Gln Pro Lys Leu Ala Glu Ala Ile Leu Asp Val Thr
 305 310 315 320
 Thr Leu Asn Pro Thr Ile Ala Gly Lys Gly Thr Val Val Ala Ser Gly
 325 330 335
 Ser Asp Asn Asp Leu Ala Asp Thr Met Gln Ile Val Ser Leu Gln Leu
 340 345 350
 Asn Lys Met Lys Ser Arg Lys Ser Cys Gly Ile Ala Val Gly Thr Thr
 355 360 365
 Ile Val Asp Ala Asp Lys Tyr Ala Val Thr Val Glu Thr Arg Leu Ile
 370 375 380
 Asp Glu Arg Ala Ala His Val Asn Ala Gln Phe Arg Phe
 385 390 395

<210> 11
 <211> 387
 <212> PRT
 <213> amino acid

<400> 11

Met	Lys	Lys	Leu	Leu	Lys	Ser	Val	Leu	Ala	Phe	Ala	Val	Leu	Gly	Ser	1	5	10	15
Ala	Ser	Ser	Leu	His	Ala	Leu	Pro	Val	Gly	Asn	Pro	Ala	Glu	Pro	Ser	20	25	30	
Leu	Met	Ile	Asp	Gly	Ile	Leu	Trp	Glu	Gly	Phe	Gly	Gly	Asp	Pro	Cys	35	40	45	
Asp	Pro	Cys	Thr	Thr	Trp	Cys	Asp	Ala	Ile	Ser	Leu	Arg	Leu	Gly	Tyr	50	55	60	
Tyr	Gly	Asp	Phe	Val	Phe	Asp	Arg	Val	Leu	Lys	Thr	Asp	Val	Asn	Lys	65	70	75	80
Gln	Phe	Glu	Met	Gly	Ala	Ala	Pro	Thr	Gly	Asp	Ala	Asp	Leu	Thr	Thr	85	90	95	
Ala	Pro	Thr	Pro	Ala	Ser	Arg	Glu	Asn	Pro	Ala	Tyr	Gly	Lys	His	Met	100	105	110	
Gln	Asp	Ala	Glu	Met	Phe	Thr	Asn	Ala	Ala	Tyr	Met	Ala	Leu	Asn	Ile	115	120	125	
Trp	Asp	Arg	Phe	Asp	Val	Phe	Cys	Thr	Leu	Gly	Ala	Thr	Ser	Gly	Tyr	130	135	140	
Leu	Lys	Gly	Asn	Ser	Ala	Ala	Phe	Asn	Leu	Val	Gly	Leu	Phe	Gly	Arg	145	150	155	160
Asp	Glu	Thr	Ala	Val	Ala	Ala	Asp	Asp	Ile	Pro	Asn	Val	Ser	Leu	Ser	165	170	175	
Gln	Ala	Val	Val	Glu	Leu	Tyr	Thr	Asp	Thr	Ala	Phe	Ala	Trp	Ser	Val	180	185	190	
Gly	Ala	Arg	Ala	Ala	Leu	Trp	Glu	Cys	Gly	Cys	Ala	Thr	Leu	Gly	Ala	195	200	205	
Ser	Phe	Gln	Tyr	Ala	Gln	Ser	Lys	Pro	Lys	Val	Glu	Glu	Leu	Asn	Val	210	215	220	
Leu	Cys	Asn	Ala	Ala	Glu	Phe	Thr	Ile	Asn	Lys	Pro	Lys	Gly	Tyr	Val	225	230	235	240
Gly	Gln	Glu	Phe	Pro	Leu	Asn	Ile	Lys	Ala	Gly	Thr	Val	Ser	Ala	Thr	245	250	255	
Asp	Thr	Lys	Asp	Ala	Ser	Ile	Asp	Tyr	Asn	Glu	Trp	Gln	Ala	Ser	Leu	260	265	270	
Ala	Leu	Ser	Tyr	Arg	Leu	Asn	Met	Phe	Thr	Pro	Tyr	Ile	Gly	Val	Lys	275	280	285	
Trp	Ser	Arg	Ala	Ser	Phe	Asp	Ala	Asp	Thr	Ile	Arg	Ile	Ala	Gln	Pro	290	295	300	

Lys Leu Glu Thr Ser Ile Leu Lys Met Thr Thr Trp Asn Pro Thr Ile
305 310 315 320

Ser Gly Ser Gly Ile Asp Val Asp Thr Lys Ile Thr Asp Thr Leu Gln
325 330 335

Ile Val Ser Leu Gln Leu Asn Lys Met Lys Ser Arg Lys Ser Cys Gly
340 345 350

Leu Ala Ile Gly Thr Thr Ile Val Asp Ala Asp Lys Tyr Ala Val Thr
355 360 365

Val Glu Thr Arg Leu Ile Asp Glu Arg Ala Ala His Val Asn Ala Gln
370 375 380

Phe Arg Phe
385

<210> 12
<211> 404
<212> PRT
<213> amino acid

<400> 12

Met Lys Lys Leu Leu Lys Ser Val Leu Ala Phe Ala Val Leu Gly Ser
1 5 10 15

Ala Ser Ser Leu His Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
20 25 30

Leu Met Ile Asp Gly Ile Leu Trp Glu Gly Phe Gly Gly Asp Pro Cys
35 40 45

Asp Pro Cys Thr Thr Trp Cys Asp Ala Ile Ser Leu Arg Leu Gly Tyr
50 55 60

Tyr Gly Asp Phe Val Phe Asp Arg Val Leu Lys Thr Asp Val Asn Lys
65 70 75 80

Gln Phe Glu Met Gly Pro Val Pro Thr Thr Thr Asp Thr Asp Ala Ala
85 90 95

Ala Asp Ile Thr Thr Ser Thr Pro Arg Glu Asn Pro Ala Tyr Gly Lys
100 105 110

His Met Gln Asp Ala Glu Met Phe Thr Asn Ala Ala Tyr Met Ala Leu
115 120 125

Asn Ile Trp Asp Arg Phe Asp Val Phe Cys Thr Leu Gly Ala Thr Ser
130 135 140

Gly Tyr Leu Lys Gly Asn Ser Ala Ser Phe Asn Leu Val Gly Leu Phe
145 150 155 160

Gly Asp Gly Val Ala Asn Ala Ala Asn Ala Ile Ala Thr Val Ala Ala
 165 170 175
 Asp Ser Leu Pro Asn Val Ser Leu Ser Gln Ala Val Val Glu Leu Tyr
 180 185 190
 Thr Asp Thr Ala Phe Ala Trp Ser Val Gly Ala Arg Ala Ala Leu Trp
 195 200 205
 Glu Cys Gly Cys Ala Thr Leu Gly Ala Ser Phe Gln Tyr Ala Gln Ser
 210 215 220
 Lys Pro Lys Val Glu Glu Leu Asn Val Leu Cys Asn Ala Ala Gln Phe
 225 230 235 240
 Thr Ile Asn Lys Pro Lys Gly Tyr Val Gly Lys Glu Phe Pro Leu Ala
 245 250 255
 Leu Thr Ala Gly Thr Asp Ser Ala Thr Asp Thr Lys Asp Ala Ser Ile
 260 265 270
 Asp Tyr Asn Glu Trp Gln Ala Ser Leu Ala Leu Ser Tyr Arg Leu Asn
 275 280 285
 Met Phe Thr Pro Tyr Ile Gly Val Lys Trp Ser Arg Ala Ser Phe Asp
 290 295 300
 Ala Asp Thr Ile Arg Ile Ala Gln Pro Lys Leu Ala Glu Ala Ile Leu
 305 310 315 320
 Asp Val Thr Thr Trp Asn Pro Thr Ile Ala Gly Ala Gly Thr Ile Ala
 325 330 335
 Asp Gly Thr Gly Ala Ala Ala Thr Ala Asn Gly Leu Ala Asp Thr Leu
 340 345 350
 Gln Ile Val Ser Leu Gln Leu Asn Lys Met Lys Ser Arg Lys Ser Cys
 355 360 365
 Gly Leu Ala Ile Gly Thr Thr Ile Val Asp Ala Asp Lys Tyr Ala Val
 370 375 380
 Thr Val Glu Thr Arg Leu Ile Asp Glu Arg Ala Ala His Val Asn Ala
 385 390 395 400
 Gln Phe Arg Phe

<210> 13
 <211> 389
 <212> PRT
 <213> amino acid

<400> 13

Met Lys Lys Leu Leu Lys Ser Ala Leu Leu Phe Ala Thr Thr Gly Ser
 1 5 10 15

Ala	Leu	Ser	Leu	Gln	Ala	Leu	Pro	Val	Gly	Asn	Pro	Ala	Glu	Pro	Ser	20	25	30
Leu	Leu	Ile	Asp	Gly	Thr	Met	Trp	Glu	Gly	Ala	Ser	Gly	Asp	Pro	Cys	35	40	45
Asp	Pro	Cys	Ser	Thr	Trp	Cys	Asp	Ala	Ile	Ser	Ile	Arg	Ala	Gly	Tyr	50	55	60
Tyr	Gly	Asp	Tyr	Val	Phe	Asp	Arg	Ile	Leu	Lys	Val	Asp	Val	Asn	Lys	65	70	75
Thr	Ile	Ser	Met	Gly	Thr	Ala	Pro	Thr	Gly	Asn	Ala	Ala	Ala	Asp	Phe	85	90	95
Lys	Thr	Val	Ala	Asp	Arg	Asn	Asn	Ile	Ala	Tyr	Gly	Lys	His	Met	Gln	100	105	110
Asp	Ala	Glu	Trp	Ser	Thr	Asn	Ala	Ala	Phe	Leu	Ala	Leu	Asn	Ile	Trp	115	120	125
Asp	Arg	Phe	Asp	Val	Phe	Cys	Thr	Leu	Gly	Ala	Ser	Asn	Gly	Tyr	Leu	130	135	140
Lys	Ala	Asn	Ala	Ala	Ala	Phe	Asn	Leu	Val	Gly	Leu	Leu	Gly	Val	Thr	145	150	155
Gly	Thr	Asp	Leu	Gln	Gly	Gln	Tyr	Pro	Asn	Val	Ala	Ile	Ser	Gln	Gly	165	170	175
Leu	Val	Glu	Leu	Tyr	Thr	Asp	Thr	Thr	Phe	Ser	Trp	Ser	Val	Gly	Ala	180	185	190
Arg	Gly	Ala	Leu	Trp	Glu	Cys	Gly	Cys	Ala	Thr	Leu	Gly	Ala	Glu	Phe	195	200	205
Gln	Tyr	Ala	Gln	Ser	Asn	Pro	Lys	Ile	Glu	Met	Leu	Asn	Val	Ile	Ser	210	215	220
Ser	Pro	Thr	Gln	Phe	Val	Ile	His	Lys	Pro	Arg	Gly	Tyr	Lys	Gly	Thr	225	230	235
Ala	Ala	Asn	Phe	Pro	Leu	Pro	Leu	Thr	Ala	Gly	Thr	Glu	Ser	Ala	Thr	245	250	255
Asp	Thr	Lys	Ser	Ala	Thr	Ile	Lys	Tyr	Asn	Glu	Trp	Gln	Ile	Gly	Leu	260	265	270
Ala	Leu	Ser	Tyr	Arg	Leu	Asn	Met	Leu	Val	Pro	Tyr	Ile	Gly	Val	Asn	275	280	285
Trp	Ser	Arg	Ala	Thr	Phe	Asp	Ala	Asp	Ser	Ile	Arg	Ile	Ala	Gln	Pro	290	295	300
Lys	Leu	Pro	Thr	Ala	Ile	Leu	Asn	Leu	Thr	Thr	Trp	Asn	Pro	Thr	Leu	305	310	315

Leu Gly Glu Ala Thr Thr Ile Asn Thr Gly Ala Lys Tyr Ala Asp Gln
 325 330 335

Leu Gln Ile Ala Ser Leu Gln Ile Asn Lys Met Lys Ser Arg Lys Ala
 340 345 350

Cys Gly Ile Ala Val Gly Ala Thr Leu Ile Asp Ala Asp Lys Trp Ser
 355 360 365

Ile Thr Gly Glu Ala Arg Leu Ile Asn Glu Arg Ala Ala His Val Asn
 370 375 380

Ala Gln Phe Arg Phe
 385

<210> 14
 <211> 402
 <212> PRT
 <213> amino acid

<400> 14

Met Lys Lys Leu Leu Lys Ser Ala Leu Leu Phe Ala Ala Thr Gly Ser
 1 5 10 15

Ala Leu Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ala Glu Pro Ser
 20 25 30

Leu Leu Ile Asp Gly Thr Met Trp Glu Gly Ala Ser Gly Asp Pro Cys
 35 40 45

Asp Pro Cys Ala Thr Trp Cys Asp Ala Ile Ser Ile Arg Ala Gly Tyr
 50 55 60

Tyr Gly Asp Tyr Val Phe Asp Arg Val Leu Lys Val Asp Val Asn Lys
 65 70 75 80

Thr Phe Ser Gly Met Ala Ala Thr Pro Thr Gln Ala Thr Gly Asn Ala
 85 90 95

Ser Asn Thr Asn Gln Pro Glu Ala Asn Gly Arg Pro Asn Ile Ala Tyr
 100 105 110

Gly Arg His Met Glu Asp Ala Glu Trp Phe Ser Asn Ala Ala Phe Leu
 115 120 125

Ala Leu Asn Ile Trp Asp Arg Phe Asp Ile Phe Cys Thr Leu Gly Ala
 130 135 140

Ser Asn Gly Tyr Phe Lys Ala Ser Ser Ala Ala Phe Asn Leu Val Gly
 145 150 155 160

Leu Ile Gly Phe Ser Ala Ala Ser Ser Ile Ser Thr Asp Leu Pro Thr
 165 170 175

Gln Leu Pro Asn Val Gly Ile Thr Gln Gly Val Val Glu Phe Tyr Thr
 180 185 190
 Asp Thr Ser Phe Ser Trp Ser Val Gly Ala Arg Gly Ala Leu Trp Glu
 195 200 205
 Cys Gly Cys Ala Thr Leu Gly Ala Glu Phe Gln Tyr Ala Gln Ser Asn
 210 215 220
 Pro Lys Ile Glu Met Leu Asn Val Thr Ser Ser Pro Ala Gln Phe Val
 225 230 235 240
 Ile His Lys Pro Arg Gly Tyr Lys Gly Ala Ser Ser Asn Phe Pro Leu
 245 250 255
 Pro Ile Thr Ala Gly Thr Thr Glu Ala Thr Asp Thr Lys Ser Ala Thr
 260 265 270
 Ile Lys Tyr Asn Glu Trp Gln Val Gly Leu Ala Leu Ser Tyr Arg Leu
 275 280 285
 Asn Met Leu Val Pro Tyr Ile Gly Val Asn Trp Ser Arg Ala Thr Phe
 290 295 300
 Asp Ala Asp Thr Ile Arg Ile Ala Gln Pro Lys Leu Lys Ser Glu Ile
 305 310 315 320
 Leu Asn Ile Thr Thr Trp Asn Pro Ser Leu Ile Gly Ser Thr Thr Ala
 325 330 335
 Leu Pro Asn Asn Ser Gly Lys Asp Val Leu Ser Asp Val Leu Gln Ile
 340 345 350
 Ala Ser Ile Gln Ile Asn Lys Met Lys Ser Arg Lys Ala Cys Gly Val
 355 360 365
 Ala Val Gly Ala Thr Leu Ile Asp Ala Asp Lys Trp Ser Ile Thr Gly
 370 375 380
 Glu Ala Arg Leu Ile Asn Glu Arg Ala Ala His Met Asn Ala Gln Phe
 385 390 395 400
 Arg Phe

<210> 15
 <211> 389
 <212> PRT
 <213> amino acid

<400> 15

Met Lys Lys Leu Leu Lys Ser Ala Leu Leu Ser Ala Ala Phe Ala Gly
 1 5 10 15
 Ser Val Gly Ser Leu Gln Ala Leu Pro Val Gly Asn Pro Ser Asp Pro
 20 25 30

Ser Leu Leu Ile Asp Gly Thr Ile Trp Glu Gly Ala Ala Gly Asp Pro
 35 40 45
 Cys Asp Pro Cys Ala Thr Trp Cys Asp Ala Ile Ser Leu Arg Ala Gly
 50 55 60
 Phe Tyr Gly Asp Tyr Val Phe Asp Arg Ile Leu Lys Val Asp Ala Pro
 65 70 75 80
 Lys Thr Phe Ser Met Gly Ala Lys Pro Thr Gly Ser Ala Ala Ala Asn
 85 90 95
 Tyr Thr Thr Ala Val Asp Arg Pro Asn Pro Ala Tyr Asn Lys His Leu
 100 105 110
 His Asp Ala Glu Trp Phe Thr Asn Ala Gly Phe Ile Ala Leu Asn Ile
 115 120 125
 Trp Asp Arg Phe Asp Val Phe Cys Thr Leu Gly Ala Ser Asn Gly Tyr
 130 135 140
 Ile Arg Gly Asn Ser Thr Ala Phe Asn Leu Val Gly Leu Phe Gly Val
 145 150 155 160
 Lys Gly Thr Thr Val Asn Ala Asn Glu Leu Pro Asn Val Ser Leu Ser
 165 170 175
 Asn Gly Val Val Glu Leu Tyr Thr Asp Thr Ser Phe Ser Trp Ser Val
 180 185 190
 Gly Ala Arg Gly Ala Leu Trp Glu Cys Gly Cys Ala Thr Leu Gly Ala
 195 200 205
 Glu Phe Gln Tyr Ala Gln Ser Lys Pro Lys Val Glu Glu Leu Asn Val
 210 215 220
 Ile Cys Asn Val Ser Gln Phe Ser Val Asn Lys Pro Lys Gly Tyr Lys
 225 230 235 240
 Gly Val Ala Phe Pro Leu Pro Thr Asp Ala Gly Val Ala Thr Ala Thr
 245 250 255
 Gly Thr Lys Ser Ala Thr Ile Asn Tyr Asn Glu Trp Gln Val Gly Ala
 260 265 270
 Ser Leu Ser Tyr Arg Leu Asn Ser Leu Val Pro Tyr Ile Gly Val Gln
 275 280 285
 Trp Ser Arg Ala Thr Phe Asp Ala Asp Asn Ile Arg Ile Ala Gln Pro
 290 295 300
 Lys Leu Pro Thr Ala Val Leu Asn Leu Thr Ala Trp Asn Pro Ser Leu
 305 310 315 320
 Leu Gly Asn Ala Thr Ala Leu Ser Thr Thr Asp Ser Phe Ser Asp Phe
 325 330 335

Met Gln Ile Val Ser Cys Gln Ile Asn Lys Phe Lys Ser Arg Lys Ala
 340 345 350

Cys Gly Val Thr Val Gly Ala Thr Leu Val Asp Ala Asp Lys Trp Ser
 355 360 365

Leu Thr Ala Glu Ala Arg Leu Ile Asn Glu Arg Ala Ala His Val Ser
 370 375 380

Gly Gln Phe Arg Phe
 385

<210> 16

<211> 35

<212> DNA

<213> Nucleotides

<400> 16

ggggatccgc caccatgctg cctgtgggga atcct

35

<210> 17

<211> 28

<212> DNA

<213> Nucleotides

<400> 17

ggggctcgag ctattaacgg aactgagc

28